

Notice of Allowability

Application No.

09/593,121

Examiner

Fred Ferris

Applicant(s)

KHAN ET AL.

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 1 June 2004.
2. ☒ The allowed claim(s) is/are 1-28.
3. ☒ The drawings filed on 01 June 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 8-304
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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DETAILED ACTION

1. *Claims 1-28 have been presented for examination based on applicant's request for reconsideration and arguments filed 1 June 2004. Claims 1-28 have now been allowed over the prior art of record.*

Response to Arguments

2. *Applicant's arguments filed on 1 June 2004 with respect to claims 1-28 have been fully considered and are persuasive. The 35 USC 103(a) rejection of 1-28 has been withdrawn.*

Regarding applicant's response to the objection to the drawings: *Applicant's have submitted corrected drawings of Figures 1 and 2 to include the legend "Prior Art". The examiner concurs with applicant's arguments related to Figure 3 as being a means for describing an embodiment of the claimed invention.*

Accordingly, the examiner withdraws the objection to Figures 1-3.

Regarding applicant's response to 103(a) rejection: *Applicant's have presented argument's which are centered around the use of flow-based scale-up in conjunction unstructured gridding as being the novel aspect and distinguishing the claimed invention over the prior art of record. The examiner concurs that while the elements of flow-based scale-up and unstructured grids are in fact independently disclosed in the prior art, there is no specific indication or teaching that the Farmer upscaling works on unstructured grids since the arrows shown in Figure 16, blocks 68, 70, indicate upscaling on the structured gridder (68) only,*

and not on the unstructured gridder (40c1). The passages recited at column 27, line 40 to column 28, line 15 of Farmer further support this reasoning. (also see interview summary dated 3 August 2004.) Accordingly, the examiner withdraws the 103(a) rejection of claims 1-28.

Allowable Subject Matter

3. *Claims 1-28 have been allowed over the prior art of record.*

The following is an examiner's statement of reasons for allowance:

Applicants are disclosing a method of scaling up permeabilities associated with a fine-scale grid of cells representative of a porous medium to permeabilities associated with a coarse-scale grid of cells representative of a porous medium. The method includes Voronoi computational grids populated with permeabilities and solving flow equations, inter-node fluxes, pressure gradients, and inter-node averages in calculating the up-scaled permeabilities. These features are generally disclosed in the prior art of record. However, the prior art of record, while disclosing these features does not meet the conditions as suggested in MPEP section 2132, namely:

*"The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an **ipsissimis verbis** test, i.e., identity of terminology is not required. **In re Bond**, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."*

In this case, the prior art of record does not disclose the specific sequence of steps relating to calculating the flow-based scale-up of permeabilities where flow equations are solved for a computational unstructured grid as recited in independent claims 1, 20, and 25 and disclosed in applicant's specification page 8, line 16 to page 18, line 24 (especially page 15, line 19 to page 18, line 14, Figs. 6&7), in the context of the claims. Claims 2-19, 21-24, and 25-28 are allowable as being dependent from independent claims 1, 20, and 25 respectively. (Also see interview summary dated 3 August 2004)

The closest prior art uncovered during examination discloses elements of the claimed invention as follows:

- U.S. patent 6,106,561 issued to Farmer: Discloses scaling permeabilities, generating Voronoi computational grids, using a structured Areal gridder, populating grids with permeabilities, solving flow equations, calculating inter-node averages, transmissibilities, Delaunay triangulation, and an up-scaler for structured grids.*
- "Flexible Streamline Grids for Reservoir Simulation", M.G. Edwards, Stanford University – Petroleum Engineering Dept., October 1998: Discloses the flexible grid FLEX simulator for reservoir simulation and solving flow equations representing porous medium.*

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 703-305-9670 and whose normal working hours are 8:30am to 5:00pm Monday to Friday.

Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 703-305-3900.

The Official Fax Numbers are:

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